

Divisional Application of
Yahya HAGHIRI-TEHRANI
Filed: 09 December 1999

IN THE SPECIFICATION:

Page 1, please change the title of the invention to --METHOD FOR PRODUCING A CIRCUIT UNIT--;

Page 1, before the first line of text, insert the centered headings:

--BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION--

before the first and second paragraphs, insert the centered heading:

--RELATED TECHNOLOGY--.

Page 2, between lines 9 and 10, insert the following:

--From US 4,960893 (Inoue) a circuit unit in the form of an IC card is known. The IC card comprises an electronic module with a coil structure being formed on the semiconductor substrate of the electronic module. A coil may be formed of two or more coil structures which are deposited on different metallic layers having insulation layers between the metallic layers whereat the metallic layers are interconnected by means of a central conductive member which extends between the distinct metallic layers.

However, the Inoue patent teaches forming the coil on the substrate of the IC chip. As the production of semiconductor devices is very expensive and the yield depends directly on the area of semiconductor covered by the IC chip, the teaching of Inoue has both the disadvantage of high cost and low yield as the area covered by the an IC comprising coil structure is enormous. The size of the IC chip has the further disadvantage of being susceptible to mechanical stress. The IC chip is embedded in the card body which is flexible therefore torsion or bend may destroy the IC card or the IC chip.

From JP 6 336096 a chip card is known which is produced from two insulating substrates. Each of the substrates has a coil pattern. After connecting the two substrates by an insulating adhesive the two coil patterns form one coil.

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However, as it is stated expressly not to use a through hole for contacting the two coil patterns and as the coil patterns are formed on different substrates, chip cards having coil layers and insulating layers which are applied alternately to a substrate are discouraged.

From EP 0 547 563 B1 a printed circuit board antenna is known which has a plurality of different coil layers. However the European patent does not show the use of an IC chip. In particular this is a disadvantage because the two coil ends are on different sides of the circuit board. If an IC chip is to be mounted on one side of the circuit board an additional through hole is necessary to connect the IC to the second end of the coil. Additional connectors are also necessary to connect the different layers of the coil which is especially a disadvantage because an additional step is necessary to insert the connectors.--;

✓
line 15, delete this line entirely and ✓ substitute therefor the centered heading:

--BRIEF SUMMARY OF THE INVENTION--

Page 2, last paragraph, line 3, change number "44 16 197.4" to --44 16 697.4--;

Page 3, between the third and fourth paragraphs, insert the centered heading:

--BRIEF DESCRIPTION OF THE DRAWINGS--;

✓
line 27, change "A-A" to --III-III--.

Page 4, before the first line, insert the centered heading:

--DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION--

;

✓
line 7, before "ends" insert --free--;

line 19, after "layer" insert --section--;

line 20, after "layer" insert --section--;

line 21, after "layer" insert --section--;

line 27, after "layer" insert --section--;

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✓
line 29, after "layer" insert --section--;
line 30, after "layer" insert --section--;
line 31, before "end" insert --first--; after "layer" insert --section--;
line 32, change "end" to --second end area--; after "layer" insert --section--

✓
Page 5, line 1, after "layer" insert --section--;
line 3, after "layer" (both occurrences) insert --section--;
line 4, after "layer" insert --section--;
line 6, change "layers" to --layer sections--;
line 8, change "layers" to --layer sections--;
ME line 14, change "layers" to --layer sections--;
line 16, change "layers" to --layer sections--;
line 17, after "that" insert --first--; after "layer" insert --section--; after "on"
insert --(e.g. layer 9)--;
line 19, after "layer" insert --section (e.g. layer 17)--;
line 20, after "overprint" insert --first--; after "layer" insert --section--;
line 22, after "printed" insert --first--; before "which" insert --of the coil layer
sections--;
line 24, before "end" insert --first--; after "layer" (each occurrence) insert
--section--;
line 26, after "from" insert --first--;
ME line 28, change "layers" to --layer sections--;
line 30, after "coil" insert --section--;
line 32, after "layer" insert --section--;
line 33, change "end" to --first ends--; change "layer" to --layers--.
Page 6, line 1, after "layer" insert --section--;
line 2, after "internal" insert --or second--;

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line 3, after "layer" (first occurrence) insert --section--; after "with" insert --second end of--; after "9" insert --(Figure 3)--; after "external" insert --first--;

line 6, after "layer" insert --section--; after "free" insert --first--;

line 8, after "layer" insert --section--;

line 10, after "covering" insert --insulating--;

A2 line 14, after "with" insert --first--; after "coil" insert - formed by electrically connected sections 9 and 17--;

line 22, change "A-A" to --III-III--;

line 23, after "layer" insert --section--;

line 25, after "layer" insert --section--;

A3 line 26, after "layer" insert --section--; after the sentence ending with the numeral "9", insert the following:

--Layer 17 is located farther from the substrate 1 than layer 9. Second ends 15a and 19a of layers 9 and 17 overlap at the window 13 in insulating layer 11. A portion 11a of layer 11 overlaps second end 15a of layer 9.--

Page 7, line 1, change "Fig. 4 shows" to --Figs. 4A and 4B show--;

line 2, after "coil" insert --first--;

line 31, change "Fig. 5 shows" to --Figs. 5A and 5B show--.

Page 8, line 27, after "layer" insert --section--;

line 28, after "layer" insert --section--;

line 31, change "layers" to --layer sections--;

line 32, change "compound" to --composite--;

line 34, after "layer" (each occurrence) insert --section--;

line 35, change "layers" to --layer sections--.

Page 9, line 2, change "layers" to --layer sections--;

line 5, change "layers" (each occurrence) to --layer sections--;

line 8, change "layers" to --sections--;

line 12, before "coil" insert --ends of--; change "layers" to --sections--;

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line 14, change "Fig. 8 coil layers" to --Fig. 7 ends of coil sections--;
line 17, before "coil" insert --the end of--; after "layer" insert --section--;
line 18, before "coil" insert --the end of--; after "layer" insert --section--;
line 19, change "layers" to --sections--;
line 20, after "layer" insert --section--;
line 22, change "layers" to --layer sections--;
line 25, change "layers" to --layer sections--;
line 28, before "coil" insert --ends of--; change "layers" to --layer sections--;
line 30, change "layers" to --layer sections--;
line 31, change "Fig. 10" to --Figs. 10A and 10B--;
line 32, before "coil" insert --ends of--; change "layers" to --layer sections--;
line 35, after "layer" insert --section--.
Page 10, line 1, after "layer" insert --section--;
line 2, after "layer" (each occurrence) insert --section--;
line 4, after "layer" insert --section--;
line 12, after "layer" insert --section--;
line 14, after "layer" insert --section--;
line 16, after "layer" insert --section--;
line 20, change "layers" to --layer sections--;
line 21, change "layers" to --sections--.

IN THE ABSTRACT:

Change line 1 to read: --A circuit unit having a--.

VIE Line 4, change "layers" to --layer sections--.
Line 5, change "layers" to --layer sections--.
Line 7, before "coil" insert --first--.